Information Security · Networks · Processor
Architecture
General Resources · NORTH Help

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Processor Architecture

This unit covers advanced topics within processor architecture. It looks at structures of both uniprocessor systems and multiprocessor systems.

Overview: Processor Design: Advanced Topics · Survey of High Performance Architectures · CPU Organization Overview · Advanced Topics in Microarchitecture
Prerequisites: Computer Architecture

Topics	References	Tutorials	Patents
Pipelining (Stall, Bubble, Multiple, Flush) [+]		• Tutorial: Pipelining • Pipelining • Instruction Pipelining • Advanced Issues in Pipelining	
Superscalar Architecture [+]	• Asynchronous Superscalar Architecture • Superscalar Processor Architecture	• The Superscalar Hardware Architecture of the MC68060, Joseph Circello, Computer Museum History Center, Video (25 minutes),Hot Chips VI - 1994 [8/15/1994 1 PM (Pacific)]	
VLIW [+]		• VLIW/Superscalar Processors	
Multiprocessors [+]		• Multiprocessor Systems • Parallel Processors • Scalable Multiprocessors and the DASH Approach John Hennessy Video (52 minutes) Computer Museum History Center 4/10/1992 1 PM (Pacific) • Cache-Coherent Multiprocessors: an Easy Approach to High-Performance Computing Forest Baskett Viddeo (40 minutes) Computer Museum History Center 10/18/1990 1 PM	

(Pacific)

Multithreaded Processors [+]	• Multithreading documents list • M. J. Flynn and A. Podvin, *Shared Resource Multiprocessing*, IEEE Computer, pp. 20-28, March 1972.	• The MAJC Processor Architecture, Marc Tremblay, Video (60 minutes), Stanford University, [3/29/2000 4:15 AM (Pacific)]	• 5430851
Trace Processing [+]	• Reference list • Trace Processors • Rotenberg, Eric, *Trace Processors: Exploiting Hierarchy and Speculation*, Doctorial Thesis, University of Wisconsin-Madison, 1999.	• Trace Processors and Control Independence Eric Rotenberg, Video (60 minutes) [4/20/1999 3:30 PM (Pacific)]	
Reconfigurable Processors, FPGA [+]	• Reference list • DRHW WWW Library • Adaptive hardware becomes a reality using electrically reconfigurable arrays (ERAs) • The Nano Processor: a low resource reconfigurable processor • The implementation of hardware subroutines on field programmable gate arrays	• Reconfigurable Computing	
Memory Hierarchy* [+]	• Memory Hierarchy in Cache Based Systems • CPUs combined with bulk memory reference list • Memory accessing (e.g. prefetch) and RAMBUS reference list	• Memory Hierarchy Overview	
Vector Processors [+]	• Vector Processors Overview • Vector pipelining, chaining, and speed on the IBM 3090 and Cray X-MP	• Vector Processing	
SIMD [+]	• SIMD Instructions • SIMD Architechtures		

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MIMD [+]

- MIMD
  Architechtures

Advanced Units: Instruction Sets · Memory Data Flow Techniques · Register Data Flow Techniques

* Denotes a topic that is useful but not necessary.

NORTH: North Online Relational Training Hierarchy
Developed by: Nick Galotti, Justin Marrese, Maulin Patel, Mike Pyzocha as part of a project for WPI

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Computer Architecture

Computer Architecture is the study of the interconnection of the various components of a computer. The goal of this unit is to provide detailed information about the architecture of the many components of a computer.

Overview: WWW Computer Architecture ·

Book: Computer Architecture: A Quantitative Approach
Author: Hennessy and Patterson
ISBN: 1558605967

Prerequisites: Micro Processor Systems · VLSI Systems · Operating Systems

Topics	References	Tutorials	Patents
Computer Organization [+]		• Computer Organization • Slides from technical training classes	
Processors and Systems [+]	• Anatomy of Modern Processors		
I/O Systems [+]		• I/O Systems	
Memory Systems [+]		• Memory Systems	
Pipeline Structures [+]		• Pipelines	

Advanced Units: Processor Architecture · Instruction Processing

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